In the Claims

The status of claims in the case is as follows:

1. [Currently amended] A method for filling a polygon with a minimum number of rectangles, comprising ~~the steps of~~:

bordering said polygon, including:

selecting a starting border width; and

merging border segments where possible; and then

orthogonally filling.

2. [Currently amended] A method for filling an original polygon envelope with a minimum number of stripes, comprising ~~the steps of~~:

creating a border polygon;

generating orthogonal fill stripes; and

processing uncovered areas.

3. [Currently amended] The method of claim 2, further comprising ~~the steps of~~:

receiving input parameters, said input parameters including parameters defining a minimum stripe width, a maximum stripe width, and a merge adjacent borders flag.

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4. [Original] The method of claim 2, said input parameters further including stripe overlap amount.

5. [Original] The method of claim 3, said input parameters further including wire with ends size delta, and maximum number of borders.

6. [Currently amended] The method of claim 3, said ~~step~~

~~of~~ creating a border polygon further comprising ~~the steps of~~:

calculating a maximum current polygon border width parameter for a current polygon;

responsive to said maximum current polygon border width parameter, calculating a border width parameter for a current border;

creating a border polygon with a width equal to said border width parameter;

responsive to said merge adjacent borders flag being enabled, creating a new border including merging said current border with a previous border if possible;

responsive to said new border from said merging ~~step~~, creating a new fill polygon;

creating a least encompassing rectangle for said new fill polygon;

responsive to said least encompassing rectangle being

contained entirely within said original polygon envelope, ending said ~~step of~~ creating a border polygon and passing any uncovered area within said new fill polygon to said generating ~~step~~; otherwise, returning to said ~~step for~~ calculating width to process said new fill polygon as said current polygon.

7. [Currently amended] The method of claim 6, said ~~step for~~ calculating a maximum current polygon border width further comprising ~~the steps of~~:

adjusting said maximum stripe width input parameter to a new upper limit which reflects characteristics of said current polygon as well as any previous border polygons.

8. [Currently amended] The method of claim 7, said adjusting ~~step~~ further comprising ~~the steps of~~:

calculating the length of each side of said current polygon;

deriving a smallest side length parameter equal to the larger of (1) a first factor times said minimum stripe width or (2) the length of the shortest side obtained from said ~~step for~~ calculating length;

setting said smallest side length parameter from said deriving ~~step~~ to a reduced amount by a second factor;

if said current polygon is an inner border and said smallest side length parameter is less than the previous border width, setting said smallest side length equal to said previous border width;

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if said smallest side length parameter is greater than said maximum stripe width parameter, setting said smallest side length parameter equal to said maximum strip width parameter; and

returning said smallest side length parameter for processing as said maximum current polygon border width parameter.

9. [Currently amended] The method of claim 8, said ~~step~~

~~for~~ calculating a border width for a current border further comprising ~~the steps of~~:

responsive to said minimum stripe width parameter and said maximum current polygon border width parameter, deriving a border width variable selectively operable for determining that said current polygon is impossible to be bordered or that said generating orthogonal fill stripe ~~step~~ be executed.

10. [Currently amended] The method of claim 9, said ~~step for~~ deriving a border width variable further comprising ~~the steps of~~

initializing said border width variable equal to said maximum current polygon border width parameter;

rounding said border width variable;

if said border width variable exceeds said maximum stripe width parameter, setting said border width variable equal to said maximum stripe width parameter;

iteratively shrinking and expanding said current polygon with a shrink value equal to said border width variable;

if said shrinking ~~step~~ causes said current polygon to shrink to nothing, then indicating a solution is not possible;

if said shrinking and expanding ~~steps~~ create a new polygon which completely covers said current polygon, then terminating said iteratively shrinking and expanding ~~steps~~ and returning said border width variable for use in subsequent processing; and

if said shrinking and expanding ~~steps~~ create a polygon which does not cover said current polygon, then returning said minimum strip width parameter for use as said border width variable in subsequent processing.

11. [Currently amended] The method of claim 6, said ~~step for~~ generating orthogonal fill stripes, further comprising ~~the steps of~~:

analyzing areas to be filled to determine optimal stripe direction; and

iteratively generating fill stripes in said optimal stripe direction to fill said areas to be filled.

12. [Currently amended] The method of claim 6, said ~~step for~~ processing uncovered areas further comprising ~~the steps of~~:

locating all uncovered polygon areas by subtracting the union of all existing fill shapes from said original polygon envelope; and

iteratively process each said uncovered polygon area, selectively bordering and orthogonally filling those uncovered polygon areas which are exterior polygons, and filling with a single rectangle uncovered polygon areas which are interior polygons.

13. [Original] The method of claim 8, said first factor being 3 and said second factor being 0.8.

14. [Original] An artwork generating system, comprising:

an exposure tool for exposing a glass master to a polygon envelop as a plurality of polygon fill stripes;

a polygon fill control module defining an optimum set of said polygon fill stripes for filling said polygon envelope, said control module being operable for

generating a first plurality of fill stripes comprising a plurality of border polygons;

generating zero to a plurality of orthogonal fill stripes; and

generating zero to a plurality of fill stripes for processing uncovered areas.

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15. [Currently amended] A method for filling an original polygon envelope with a minimum number of stripes, comprising ~~the steps of~~:

generating a first plurality of stripes for creating a border polygon;

generating a second plurality zero or more stripes comprising orthogonal fill stripes; and

generating a third plurality of zero or more stripes for processing uncovered areas.

16. [Original] A system for filling an original polygon envelope with a minimum number of stripes, comprising:

means for generating a first plurality of stripes for creating a border polygon;

means for generating a second plurality of zero or more stripes comprising orthogonal fill stripes; and

means for generating a third plurality of zero or more stripes for processing uncovered areas.

17. [Currently amended] A program storage device readable

by a machine, tangibly embodying a program of instructions executable by a machine to perform a method ~~steps~~ for filling an original polygon envelope with a minimum number of stripes, said method ~~steps~~ comprising:

generating a first plurality of stripes for creating a border polygon;

generating a second plurality of zero or more stripes comprising orthogonal fill stripes; and

generating a third plurality of zero or more stripes for processing uncovered areas.

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18. [Original] An article of manufacture comprising:

a computer useable medium having computer readable program code means embodied therein for filling an original polygon envelope with a minimum number of stripes, the computer readable program means in said article of manufacture comprising:

computer readable program code means for causing a

computer to effect generating a first plurality of stripes for creating a border polygon;

computer readable program code means for causing a computer to effect generating a second plurality of zero or more stripes comprising orthogonal fill stripes; and

computer readable program code means for causing a computer to effect generating a third plurality of zero or more stripes for processing uncovered areas.

19. [Currently amended] A computer program product or computer program element for filling an original polygon envelope with a minimum number of stripes, according to a method comprising ~~the steps of~~:

generating a first plurality of stripes for creating at least one border polygon;

generating a second plurality of zero or more stripes comprising orthogonal fill stripes; and

generating a third plurality of zero or more stripes for processing uncovered areas.

20. [Currently amended] A program storage device readable by a machine, tangibly embodying a program of instructions executable by a machine to perform a method ~~steps~~ for filling an original polygon envelope with a minimum number of stripes, said method ~~steps~~ comprising:

receiving input parameters, said input parameters including parameters defining a minimum stripe width, a maximum stripe width, and a merge adjacent borders flag;

first generating a first plurality of stripes for creating at least one border polygon;

second generating a second plurality of zero or more stripes comprising orthogonal fill stripes; and

third generating a third plurality of zero or more stripes for processing uncovered areas;

said first generating ~~step~~ including ~~the steps of~~:

calculating a maximum current polygon border width parameter for a current polygon;

responsive to said maximum current polygon border width parameter, calculating a border width parameter for a current border;

creating a border polygon with a width equal to said border width parameter;

responsive to said merge adjacent borders flag being enabled, creating a new border including merging said current border with a previous border if possible;

responsive to said new border from said merging ~~step~~, creating a new fill polygon;

creating a least encompassing rectangle for said new fill polygon; and

responsive to said least encompassing rectangle being contained entirely within said original polygon envelope, ending said ~~step of~~ creating a border polygon and passing any uncovered area within said new fill polygon to said ~~step for generating step~~ generating a second plurality of zero or more stripes comprising orthogonal fill stripes; otherwise, returning to said ~~step for~~ calculating width to process said new fill polygon as said current polygon.

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21. [Currently amended] A ~~system~~ method for filling an original polygon envelope with a minimum number of stripes~~,~~ ~~said method steps~~ comprising:

receiving means for receiving input parameters, said input parameters including parameters defining a minimum stripe width, a maximum stripe width, and a merge adjacent borders flag;

first generating means for generating a first plurality of stripes for creating at least one border polygon;

second generating means for generating a second plurality of zero or more stripes comprising orthogonal fill stripes; and

third generating means for generating a third plurality of zero or more stripes for processing uncovered areas;

22. [Re-presented -- formerly dependent claim 8] A method for filling an original polygon envelope with a minimum number of stripes, comprising of:

creating a border polygon;

generating orthogonal fill stripes;

processing uncovered areas;

receiving input parameters, said input parameters including parameters defining a minimum stripe width, a maximum stripe width, and a merge adjacent borders flag;

said creating a border polygon further comprising:

calculating a maximum current polygon border width parameter for a current polygon;

responsive to said maximum current polygon border width parameter, calculating a border width parameter for a current border;

creating a border polygon with a width equal to said border width parameter;

responsive to said merge adjacent borders flag being enabled, creating a new border including merging said current border with a previous border if possible;

responsive to said new border from said merging, creating a new fill polygon;

creating a least encompassing rectangle for said new fill polygon;

responsive to said least encompassing rectangle being contained entirely within said original polygon envelope, ending said creating a border

polygon and passing any uncovered area within said new fill polygon to said generating; otherwise, returning to said calculating width to process said new fill polygon as said current polygon;

said calculating a maximum current polygon border width including adjusting said maximum stripe width input parameter to a new upper limit which reflects characteristics of said current polygon as well as any previous border polygons by

calculating the length of each side of said current polygon;

deriving a smallest side length parameter equal to the larger of (1) a first factor times said minimum stripe width or (2) the length of the shortest side obtained from said calculating length;

setting said smallest side length parameter from said deriving to a reduced amount by a second factor;

if said current polygon is an inner border and said smallest side length parameter is less than the previous border width, setting said smallest side length equal to said previous border width;

if said smallest side length parameter is greater than said maximum stripe width parameter, setting said smallest side length parameter equal to said maximum strip width parameter; and

returning said smallest side length parameter for processing as said maximum current polygon border width parameter.

23. [Re-presented -- formerly dependent claim 9] The method of claim 22, said calculating a border width for a current border further comprising:

responsive to said minimum stripe width parameter and said maximum current polygon border width parameter, deriving a border width variable selectively operable for determining that said current polygon is impossible to be bordered or that said generating orthogonal fill

stripe be executed.

24. [Re-presented -- formerly dependent claim 10] The method of claim 23, said deriving a border width variable further comprising:

initializing said border width variable equal to said maximum current polygon border width parameter;

rounding said border width variable;

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if said border width variable exceeds said maximum stripe width parameter, setting said border width variable equal to said maximum stripe width parameter;

iteratively shrinking and expanding said current polygon with a shrink value equal to said border width variable;

if said shrinking causes said current polygon to shrink to nothing, then indicating a solution is not possible;

if said shrinking and said expanding create a new

polygon which completely covers said current polygon, then terminating said iteratively shrinking and expanding and returning said border width variable for use in subsequent processing; and

if said shrinking and expanding create a polygon which does not cover said current polygon, then returning said minimum strip width parameter for use as said border width variable in subsequent processing.

25. [Re-presented -- formerly dependent claim 13] The method of claim 22, said first factor being 3 and said second factor being 0.8.